I. MAPPING OF DECLARATION AND EXHIBITS TO THE CLAIMS

The following chart correlates the content of the declaration and exhibits previously submitted by the applicants to the elements, steps and limitations of the claims.

The following abbreviations are used to identify the documents previously submitted by the applicants.

DECL–Rule 1.131 Affidavit executed by Inventor.

CPOL–Redacted copy of the inventor's original disclosure as recorded in the assignee's "Cisco Patents On-line" (CPOL) system.

ENG-1—Document ENG-25670, "IOS CNS/AD Client System Functional Specification."

ENG-2—Document ENG-29746, "Cisco Network Services (CNS) Internet Operating System (IOS) 12.0.5T Program Plan."

ENG-3—Document ENG-28376, "CNS IOS Event Service Client System Functional Specification."

ENG-4—Document ENG-23055, "Internetworking Operating System ("IOS") Cisco Network Services for Active Directory ("CNS/AD") Client Program Plan (12.0.4)

Generally, the documents of the previously submitted Exhibit show that the software element termed "CNS Client" in the documents included all elements recited in the claims. The inventor's declaration states that the CNS Client (with features described) is part of the product that was released for sale. The CPOL document, in the section Cisco Use, states that "CNS Client for IOS (the directory-enabling element) is being released in IOS 12.0.4." This indicates that the CPOL document was written after the CNS Client was implemented (reduced to practice), and, in fact, indicates that the CNS Client is already included in a product released for sale.

CLAIM 1

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element	DECL, p. 2-3: "Cisco Systems, Inc. commercially released an embodiment of the invention before September 10, 1999, but not more than a year before the filing data of the present patent application, as part of the following Cisco software products: CNS for Client for IOS in IOS Release 12.0.4; and CNS for IOS II for IOS Release 12.0.5. Both the products CNS for Client for IOS in IOS Release 12.0.4 and CNS for IOS II for IOS Release 12.0.5 are referenced in Patent Idea Details for Idea #41685". *See* CPOL, section Cisco use, pp. 2 and 4. The preceding statement applies to all claims, as stated in the Declaration. ENG-1, p. 1: "The project provides infrastructure for IOS applications to query and access data that resides in a Directory Server via LDAP V3." Thus, an embodiment of the referenced element is a network device running IOS, using an IOS client that can access the Directory Server via LDAP. ENG-1, p. 2: "This project is a standard IOS infrastructure project that provides the infrastructure for IOS applications to query,

	access and update data that resides in a Directory Server via Lightweight Directory Access Protocol (LDAP)." ENG-1, p.3: "This project implements LDAP V3 clients plus enhancements on IOS platforms. The feature is platform independent and it should function in all platforms. LDAP support will enable the routers and switches to communicate with any vendor's directory to discover information stored on the directory."

CLAIM 2

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element.	In an embodiment, the directory enabling element is the directory-enabled CNS client. ENG-1, p. 2: "This project is a standard IOS infrastructure project that provides the infrastructure for IOS applications to query, access and update data that resides in a Directory Server via Lightweight Directory Access Protocol (LDAP)." ENG-1, p.3: "This project implements LDAP V3 clients plus enhancements on IOS platforms. The feature is platform independent and it should function in all platforms. LDAP support will enable the routers and switches to communicate with any vendor's directory to

	discover information stored on the directory." CPOL, p.2: Cisco Use: CNS Client for IOS is being released in IOS 12.0.4. It is part of the following images/platforms: [long long list of routers on which the client runs].

CLAIM 3

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	*Same as in Claim 2*
an application programming interface coupled to the directory enabling element and configured to receive directory services requests from application programs and provide the directory services requests to the directory enabling element	ENG-1, p. 4: Figure 4 depicts IOS CNS Client APIs, and Locator Services, Event Services, CNS Extension Libraries as accessible by or connected to LDAP V3. ENG-1, p. 4: In section 2.2.1, LDAP V3 is described as a feature of the product that supports all protocol elements of RFC 1777 (which describes requirements for receiving directory services requests from clients and for providing the directory services requests to the client). "LDAP V3 supports schema discovery, so an LDAP client can learn about the structure of the information in a directory.

	Because LDAP must be able to search, read, and update server information on behalf of the client, the client must have prior knowledge of the directory's schema, or have some facility for discovering and interpreting the schema." ENG-1, p. 11: Section 3.2.1.2 states "The full set of LDAP APIs will be supported on IOS." ENG-1, p. 12: Table 1: LDAP V3 API describes all the API function calls with their functionality.

CLAIM 4

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	*Same as in Claim 2*
an application programming interface coupled to the directory enabling element and configured to receive directory services requests from application programs and provide the directory services requests to the directory enabling element;	*Same as in Claim 3, element LDAP API*
a locator service coupled to the directory	ENG-1, p. 4: In section 2.2.2, Locator Services

enabling element and accessible using the application programming interface and configured to locate servers that provide the directory services in the network	are described as a feature of/coupled to the CNS Client, allowing the client to locate the closet directory server in the network. ENG-1, p.15: Section 3.2.2 states that "Locator Services client will use the IOS DistributedDirector to locate the closest Directory server in the network." ENG-1, pp.15-19: Locator API – DsGetDcName API is described in great detail, including input/output parameters for the API, Flags, Error Codes, and Domain Controller Info field definitions.

CLAIM 5

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	*Same as in Claim 2*
a bind service in the directory enabling element and coupled to a security protocol and configured to bind an external application program to the security protocol.	ENG-1, p.14: In section 3.2.1.3, the Bind Operation feature is described as part of the CNS Client, and has functionality for initiating a protocol session between a client and a server, and allow the authentication of the client to the server.

CLAIM 6

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 2, further comprising: a Unicode translation service configured to query, access, and update directory information that is encoded in a Unicode international character format	ENG-1, p.15: In section 3.2.1.4, titled Unicode and UTFS Support, "one of the key enhancements in LDAP v3 is the support for international character sets by means of utf8 encoding. ... Following utf8 functions need to be provided so that applications expecting international character strings can handle them properly... [a list of the functions implementing character string manipulation and translation is provided]."

CLAIM 7

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	*Same as in Claim 2*
a locator service coupled to the directory enabling element and configured to locate servers that provide the directory services in the network;	*Same as in Claim 4, element Locator service*
an event service coupled to the directory enabling element and configured to receive	ENG-3 is the functional specification of the Event Service Client, with descriptions of all

registration of an event and an associated responsive action from an application program, notify the application program when the event occurs, and execute the associated responsive action in response thereto	functions in the API ENG-3, p.1: System Overview: "The IOS CNS Client consists of a thin software component, Event Service Client (ESC), which depends on the rest of the features of IOS CNS Client (LDAP V3 and Locator). ESC links network elements and directory-enabled desktop applications through use of directory technology. ESC will be implemented as a Server and a Subsystem in IOS Classic" ENG-3, p. 2: Figure in Section 1.2.1 describes the overall architecture of Event Service client. (shows integration with the CNS client) ENG-3, p. 3: Figure describes the process of ESC registering with the Event Server, listening for events, consumer application registers itself with the Event Server, ESC detecting the event, and notifies the consumer application by using the applications callback functions.

CLAIM 8

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and	*Same as in Claim 2*

configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	
an application programming interface coupled to the directory enabling element and configured to receive directory services requests from application programs and provide the directory services requests to the directory enabling element;	*Same as in Claim 3, element API*
a locator service coupled to the directory enabling element and accessible using the application programming interface and configured to locate servers that provide the directory services in the network;	*Same as in Claim 4, element locator service*
an event service coupled to the directory enabling element and accessible using the application programming interface and configured to receive registration of an event and an associated responsive action from an application program, notify the application program when the event occurs, and execute the associated responsive action in response thereto.	*Same as in Claim 7, element event service*

CLAIM 9

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and	*Same as in Claim 2*

executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	
a locator service coupled to the directory enabling element and configured to locate servers that provide the directory services in the network;	*Same as in Claim 4, element locator service*
a group policy interface coupled to the directory enabling element and configured to receive and update the directory service with one or more definitions of directory services policies that apply to groups of network devices in the network	ENG-2, p.1: Describes the 12.0.5 release of the CNS client including all features of the 12.0.4 CNS Client plus CNS GPO API and IPSec Policy Agent. "Group Policy allows an organization to reduce TCO by allowing administrators to define centralized policies and applying them to groups of objects using the infrastructure provided by Cisco Directory Services. CNS GPO Resolver Service impersonates an IOS client to retrieve and send back policy information from Directory Services, requested by the IOS through use of GPO API." ENG-2, p.2: Figure 1 shows a Group Policy API as part of the components of IOS Classic 12.0.4T/12.0.5T ENG-2, p.5: The CNS GPO Resolver Service is described as: "This is an NT5 workstation based on the "CNS/AD GPO Resolver Service API for IOS – Software Unit Functional

	Specification" (ENG-29745). This daemon has been implemented and unit-tested under NT5, and so is the API. ENG-2, p.6: Test Engineering Tasks describe – Integration testing for the GPO/IPSec GPO client, indicating that the GPO client HAS already been implemented.

CLAIM 10

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network element as recited in Claim 1, comprising: a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element;	*Same as in Claim 2*
a bind service in the directory enabling element and coupled to an security protocol and configured to bind an external application program to the security protocol;	*Same as in Claim 5, bind element*
an event service coupled to the directory enabling element and accessible using the application programming interface and configured to receive registration of an event and an associated responsive action from an application program, notify the application program when the event occurs,	*Same as in Claim 7, event service element*

and execute the associated responsive action in response thereto.	

CLAIM 11

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled packet router for a packet-switched network	CPOL, p.2: "A CNS Client for IOS is being released in IOS 12.0.4. It is part of the following images/platforms: [long list of routers follows]. Example of a Router: CPOL, p.2: Cisco Use: "1. Enterprise Images ... c7200-js-mz /7200" (7200 is the platform on which the image including the CNS Client runs)

CLAIM 12

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled packet router as recited in Claim 11, comprising: a directory enabling element installed in and executed by the router, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the router;	*Same as in Claim 2*
a bind service in the directory enabling element and coupled to a security protocol and configured to bind an application program to the security protocol;	*Same as in Claim 5, bind element*
an event service coupled to the directory	*Same as in Claim 7, event service element*

enabling element and accessible using the application programming interface and configured to receive registration of an event and an associated responsive action from an application program, notify the application program when the event occurs, and execute the associated responsive action in response thereto.	

CLAIM 13

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network data switch for a packet-switched network	CPOL, p.2: Cisco Use: CNS Client is being released in IOS 12.0.4. It is part of the following images/platforms: [a huge list follows, it should include a data switch] Example of a Switch: CPOL, p. 2: Cisco Use: "5. Enterprise Plus 40 .... C4500-js40-mz 4500/4700/4500-m" (4500/4700/4500-m are the platforms on which the image including the CNS client runs)

CLAIM 14

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory-enabled network data switch as recited in Claim 13, comprising: a directory enabling element installed in and executed by the switch, and configured to query, access, and update directory information that is managed by a directory	*Same as in Claim 2*

service of a network that includes the switch;	
a bind service in the directory enabling element and coupled to a security protocol and configured to bind an application program to the security protocol;	*Same as in Claim 5, bind element*
an event service coupled to the directory enabling element and accessible using the application programming interface and configured to receive registration of an event and an associated responsive action from an application program, notify the application program when the event occurs, and execute the associated responsive action in response thereto.	*Same as in Claim 7, event service element*

CLAIM 15

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A method of using a directory-enabled network element to query, access, or update directory information of a directory service of a network that includes the directory-enabled network element, wherein the directory-enabled network element comprises a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a network that includes the network element; the method comprising the steps of:	*Same as in Claim 1 – directory-enabled query element and its functions* *Same as in Claim 2 – directory enabling network element and its funtions*

binding the application program to the security protocol;	*Same as in Claim 5 – bind element and its functions*
creating an event and an associated responsive action that are associated with the application program;	*Same as in Claim 7 – event service element and its functions*
in response to occurrence of the event, executing the responsive action, obtaining policy information from the directory service, and converting the policy information into one or more commands that are executable by the directory-enabled network element	*Same as in Claim 7—event service client component, in combination with Claim 9—group policy interface.*

CLAIM 16

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A computer-readable medium carrying one or more sequences of instructions for using a directory-enabled network element to query, access, or update directory information of a directory service of a network that includes the directory-enabled network element, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:	*Same as in Claim1 and 2*
creating and storing a directory enabling element installed in and executed by the network element, and configured to query, access, and update directory information that is managed by a directory service of a	*Same as in Claim 2, directory enabling element and its functionality*

network that includes the network element	
binding the application program to the security protocol;	*Same as in Claim 5, bind element and its functionality*
creating an event and an associated responsive action that are associated with the application program	*Same as in Claim 7, event service element and its functionality*
in response to occurrence of the event, executing the responsive action, obtaining policy information from the directory service, and converting the policy information into one or more commands that are executable by the directory-enabled network element.	*See Claim 15, last element*

CLAIM 17

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A computer-readable medium as recited in Claim 16, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the further steps of: locating a nearest directory server and binding the application program to the nearest directory server that is located;	*Same as in Claim 4, locator service element and its functionality* *Same as in Claim 5, bind operation element and its functionality*
locating a nearest event server and binding the application program to the nearest event server that is located	*Same as in Claim 4, locator service element and its functionality* *Same as in Claim 7, event service element and its functionality*

CLAIM 18

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A computer-readable medium as recited in Claim 16, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the further steps of: translating the policy information into one or more values that are ready to apply to a router, whereby a virtual private network is created between the router and another network device.	ENG-2, p.1: States that one of the IOS applications that will make use of the CNS Client is CNS Policy-based VPN.

CLAIM 19

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A computer-readable medium as recited in Claim 16, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the further steps of: translating the policy information into one or more values that are ready to apply to a set of internal data structures of a router, by calling one or more internal NOS API functions, whereby a dynamic IPSEC configuration is created that connects the router and at least one other network device	ENG-2, p.1: CNS GPOAPI and IPSec Policy Agent – "CNS GPO Resolver Service impersonates an IOS client to retrieve and send back policy information from Directory Services, requested by the IOS client through use of GPO API. ENG-2, p.2: Figure 1 ENG-2, p.5: "IOS IPSec GPO Policy Agent is an IOS GPO Client for IPSec policy. It will use the CNS GPO API to communicate policy information between Directory Service and an IOS Device. (IOS device is a router)

CLAIM 20

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A computer-readable medium as recited in Claim 16, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the further steps of establishing an application programming interface coupled to the directory enabling element and configured to receive directory services requests from application programs and provide the directory services requests to the one or more processors	*Same as in Claim 3, element API*

CLAIM 21

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory services-enabled network element	*Same as in Claim 3, element API* CPOL, p.2: Cisco Use: "CNS Client for IOS is being released in IOS 12.0.4. It is part of the following images/platforms: [a list of routers follows]." Since the API, as described in Claim 3, enables access by the client to directory services, then any router or switch [from the list above] running the CNS Client is "a directory services-enabled network element"

CLAIM 22

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A system comprising a network element enabled to automatically interface with directory services	*Same as in Claim 21* – installing and executing, by a router, of a CSN client allows the router to automatically interface with the directory services.

CLAIM 23

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
The system of claim 22, wherein the network element obtains policy information from the directory services and updates the directory service	*Same as in Claim 22, combined with the Group Policy Interface as described in Claim 9.*

CLAIM 24

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
The system of claim 22, wherein the network element includes a protocol agent for interfacing with the directory services	ENG-2, p.1: Examples of agents interfacing with the directory services include the CNS Configuration Notify Agent, and the CNS Provision Agent

CLAIM 25

Claim Elements	Facts Showing Reduction to Practice in the Exhibits and Declaration
A directory services-enabled packet router for a packet-switched network	CPOL, p.2: Cisco Use – includes a huge list of directory services enabled routers that can be used in packet-switched (IP) networks. *See Claim 21.*